Introduction

Phillips 66 Company (Phillips 66) proposes to modify the existing rail spur currently on the southwest side of the Santa Maria Refinery (SMR) located in unincorporated San Luis Obispo County California (see Figures 1 and 2). The project would include an eastward extension of the existing rail spur as well as a railcar unloading facility. The trains would deliver crude oil to the SMR for processing. The unloaded material would be transferred from the new unloading facility to existing crude-oil storage tanks via a new on-site above-ground pipeline. The unloading area would also include employee facilities such as a restroom.

The proposed tracks and unloading facilities are designed to accommodate unit trains and manifest trains. Unit trains consist of approximately 80 tank cars and associated locomotives and other supporting cars that stay together as one assembly. Manifest trains may have a variety of car types and cargos and are not fully dedicated as are unit trains. Manifest trains may deliver one or more cars to the refinery and then continue to other destinations to deliver other cargo.

Project Purpose and Objectives

The purpose of the project is to allow SMR to access a full range of competitively priced crude oil. The facility currently processes San Joaquin crude oil, one of the heaviest crude oils available. The project does not allow for an increase in the processing capacity or throughput. The project would extend the existing rail spur within the refinery and install the necessary infrastructure to safely and efficiently transfer crude oil from rail cars to the existing refinery storage tanks for processing. As defined by the International Energy Agency, the term crude oil comprises crude oil, natural gas liquids, refinery feedstocks, and additives as well as other hydrocarbons (including emulsified oils, synthetic crude oil, mineral oils extracted from bituminous minerals such as oil shale, bituminous sand, etc., and oils from coal liquefaction). Crude oil is a mineral oil consisting of a mixture of hydrocarbons of natural origin and associated impurities, such as sulphur.

Project Location

The refinery has been operating since 1955 and is located in unincorporated San Luis Obispo County, near the City of Arroyo Grande on the Nipomo Mesa. The project would occur entirely within the existing Phillips 66 boundary. In the project description and impact assessment presented below, the term ‘site’ is used to refer to the area directly affected by construction, including grading, excavation, rail construction and fencing. The larger grounds of SMR are referred to as the Phillips 66 property and the adjacent and surrounding lands within San Luis Obispo County and nearby incorporated municipalities are referred to as the project area.

Proposed Facilities

Phillips 66 proposes to modify the existing rail spur on the southwest side of the refinery to include an eastward extension as well as an unloading facility, new, on-site transfer conveyance (pipelines), and a restroom (see Figures). Additionally, CalFire has requested an unpaved eastern Emergency Vehicle Access route between the eastern end of the rail spur and Highway 1. The tracks and unloading facilities have been designed to accommodate trains of approximately 80 tank cars and associated locomotives in unit train or manifest train configurations. These trains would deliver crude oil to the facility for processing.

The unloaded material would be transferred to the existing storage tanks via a new pipeline that would be constructed across the existing coke storage area and along an existing internal refinery road.

The project would also include work within the existing refinery connecting and upgrading existing infrastructure. This includes adding a new electricity cable to an existing pipeway and adding a new fire water pipeline to an existing pipe rack. The rails on the existing rail spur would also be replaced.

The new rail spur lines would extend approximately 2600 yards from the terminus of the current spur. The unloading facility would be located at the end of the existing coke storage area and along an existing internal refinery road to and provide an efficient route for the new, above-ground pipeline to convey the crude oil to existing tanks.

The approximate construction areas are summarized below and shown on Figure 2:

- 2305 yards (2110 m) – Length of spur extension (including approximately 815 yards within the existing industrial coke plant area)
- 270-feet (82m) – Approximate width of construction area for rail extension (note that much of the area would only be affected temporarily).
- 775-yards (710 m) – Length of new pipeline from the unloading facility to the internal refinery (note that an additional 400 yards will be constructed within the existing refinery connecting to the existing storage tanks).
- 25-feet (7.5 m) – Approximate width of temporary construction area for pipeline installation

Acreage Breakdown (temporary + permanent):

- 38.6 acres – Rail Spur and Unloading Facility
- 4.1 acres – New Pipeline (mostly temporary impacts)
- 1.7 acres – Secondary Emergency Vehicle Access
- 4.5 acres – Internal Refinery Piping and Existing Track Upgrade

Collectively, the entire project, including temporary and permanent impacts, would affect approximately 48.9 acres. Of this area, a significant portion occurs within the existing refinery:

- 21.9 acres (45% of total) occurs within the existing industrial refinery area
- 27 acres occur in undeveloped areas and include portions of the rail extension, the new pipeline, and the secondary emergency vehicle access road (Figure 2).

As noted above, a significant portion of the impacts would be temporary during construction and affected plant communities would be returned to pre-project conditions following completion of construction.

Phillips 66 has designed all facilities based on geotechnical investigations and to minimize the potential for geological effects such as lateral spreading, subsidence, liquefaction, or soil collapse, and would incorporate design features such as stabilization fills, retaining walls, and removal of unstable materials if necessary.

Alternatives

Before selecting the proposed track configuration, Phillips 66 evaluated several alternatives, including 'teardrop' looped track configurations as well as a northern access track (see Figure 3 and supporting figures). The summary below compares these alternatives in terms of their areal extent, visibility from surrounding areas, amount of excavation and fill required, and potential ecological resource impacts.

Phillips 66 selected the straight track based its reduced effect on the environment compared to the other alternatives. The considered northern access would not accommodate the number of cars associated with the unit trains and was therefore technically infeasible, but also would have the highest impact on sensitive biological resources as it would need to cross the most dense population of the endangered Nipomo Mesa lupine. Both of the considered loop track configurations are challenged by the natural grade change at the southern end of the property where the Nipomo Mesa drops to the Santa Maria Valley floor. To maintain the required turn radius for the trains and to meet the grade requirements for a flat track, both loop configurations would require substantial fill along the southern portions. The small loop would require import of approximately 448,000 cubic yards of fill to raise the southern portion of the property, resulting in substantial truck trips and construction-related dust, visual impacts (e.g., from Oso Flaco Road), and other issues. The large loop was extended in an effort to avoid the grade issue, but would also require substantial fill (though less than the small loop), would have the largest construction footprint, and would encroach on the sensitive open dune habitat directly east of the refinery. The straight track requires the least excavation/fill and maximizes avoidance of sensitive natural resources.

The table below describes some of the key considerations in comparing the alternatives.

	Northern Access Track	**Small Loop Track**	**Large Loop Track**	**Straight Track (Proposed Project)**
Approximate Affected Area	Not quantified	44.23-acre footprint + 44.34 acre area enclosed by track and fencing	51.26-acre footprint + 66.27 acre area enclosed by track and fencing	48.9-acre footprint
Visibility	Medium	Highly visible fill area – 44'	Visible fill area – 25'	Low
Cut (excavation required)	Not quantified	154,000 cy	349,000 cy	120,000 cy
Fill	Not quantified	448,000 cy	218,000 cy	117,000 cy
Biological impacts	Direct impacts on endangered Nipomo Mesa lupine	Close to dune sheet habitat (70 feet)	Direct impact on dune sheet habitat	No impacts to sensitive habitat or listed species

The new facilities for the proposed project are described below.

Rail Spur Modification

Modification of the existing rail spur would include constructing up to five parallel ladder tracks, each long enough to hold an entire train (as the tracks extend east, some sets would merge reducing the affected area and the number of parallel tracks). The existing rail spur on the southern portion of the property currently provides rail access to the coke storage area and would provide a common entry point for the new tracks. Two tracks would surround an unloading rack and then would come together to form a common tail track at the east end. The tail track would allow the road locomotives to return to the common entry and leave the facility, if required, and would also allow switching the tank car strings onto and off of the unloading rack. The tail track would be long enough to accommodate two locomotives (and buffer cars) and the lead track would be long enough for 10 tank cars and the switching locomotives. A third track (the "runaround track") would allow locomotives to return to the front of the facility after dropping off an 80-car train on Track(s) 1 and (or) 2. A fourth track (Track A) would be constructed to receive a full unit train should Tracks 1 and 2 be occupied by unloading trains. The fifth track (Track B) would be used for queuing up empty cars after the unloading process is complete.

Mainline Turnout

Unit train service would not require substantial changes to the turnout from the Union Pacific mainline running north-south adjacent to the refinery. The turnout guides trains off the mainline onto the refinery's rail spur. Union Pacific may require a small change in the angle of the turnout (e.g., change from a turnout #10 to #11); however, if required, the construction of the new turnout would be a minor change from the current configuration and the construction would occur entirely within the existing disturbed track area. Because other trains continually pass through the Arroyo Grande/Santa Maria area on the Union Pacific mainline, the turnout must allow a unit train to clear the mainline without stopping. The existing rails would be replaced as part of the project.

Unloading Facility

The unloading facility would include an access platform and a system of pumps and meters, suction lines from the railcars, steam lines, and a common pipeline leading to the refinery's existing tank farm. Figure 4 provides plan and cross-section views of the proposed facility. View simulations of the facilities are provided with the figures supporting this document. The access platform would run parallel to the track, with an individual gangway and safety cage at each unloading station. The access platform and tracks would be supported by reinforced concrete construction. This area would provide structural support, spill containment (see description below), and a clear, solid work surface for the operators.

The unloading facility would be designed around "train slots" (a track that can contain an entire unit train). Union Pacific bases the number of slots on the number of trains arriving per day and/or the yearly tonnage, and the 'dwell period' (the hours that the train would be at the facility.) Phillips 66 would unload up to five trains per week. Phillips 66 estimates that a complete 80-car train would be unloaded within 12 hours. The proposed two-slot facility would allow adequate capacity unloading.

Unloading System

The unloading facility would be equipped with a 24-car unloading system with individual positive displacement pumps. The unloading rack would be configured to unload two 12-car strings simultaneously. The 600-foot-long center platform would provide access to the tops of the railcars.

The system used to unload each car would consist of an adapter unit to connect the rail car to couplings, hoses, valves, flow meters and piping connecting to a 400 gallon-per-minute (gpm) positive displacement pump. The system may employ articulated loading arms as an alternative to flexible hoses. The loading rack would be the length of 12 cars; the four additional spots would allow unloading 20 cars of either 55 or 60 feet long.

Each car's unloading system would be equipped with an air eliminator to remove vapors (mostly air) potentially mixed in with the product. Air is typically present at the beginning and end of unloading when liquid levels are low. Air removal protects the system's flow meters and ensures accurate flow measurement. This air/vapor flow would be passed through two carbon beds piped in series. The filter medium would be regenerated as needed during operations. In addition, a small volume 'prover' would be installed to allow frequent proving of flow meters. Because of high planned flow rates, a truck-mounted prover would also be available.

A computer system would be used to control and monitor the unloading system's pumps, air compressors, meters and its interface with the refinery's tank system. A new 4160V-480V power distribution center would run the pumps, ventilation system, lighting, telephones, fire alarm and fire suppression systems. Power would be supplied initially from the Carbon Plant and subsequently by extending a line from the main substation in 2015.

Fire Protection and Safety System

A new fire protection and safety system would be installed for the unloading rack, consisting of fire detection equipment, safety showers, eyewash stations, pumps, hydrants, controls and piping. The unloading rack would be equipped with a foam sprinkler deluge system and firewater monitors with foam generators at the unloading rack periphery. The foam spray system would require a foam concentrate storage tank. The system specifications are provided below. The project would also include a secondary Emergency Vehicle Access route from the eastern end of the rail spur to Highway 1.

Foam/Water Deluge System

- Square footage under canopy: 32,860 ft^2
- Divide under canopy area into 5 zones of 6,572 ft^2 each
- Assume two adjacent zones will be activated in a fire
- Design density = 0.16 GPM/ft^2
- Flow rate required = 2 x 6572 x 0.16 = 2,104 GPM
- Provide additional flow of 2 x 500 GPM monitors = 1,000 GPM
- Total fire water flow required = 3,104 GPM
- Activation of deluge valves via manual pull stations (valves) or pilot sprinkler line
- Pilot sprinkler line shall have fusible heads rated at 175^oF
- Bladder tank for foam concentrate storage sized for two consecutive activations of two adjacent zones.
- Pressurizing of line downstream of deluge valve activates pressure switch for remote alarm and pressurizes hydraulic valve that opens to allow foam concentrate flow to ratio proportioner
- Assumed foam concentrate is 1% type

Foam/Water Monitors

- Monitors shall be self-educting nozzles with foam totes
- North side monitors will be mounted at grade approximately 50' away from unloading cars
- South side monitors will be provided based on final road clearance dimensions (minimum clearance from empty cars on Track B).

Water Supply System

- Install approximately 2300 feet of 8-inch pipe from the existing water line at the Coke Control Room to the unloading rack area. The supply for this pipe comes from incorporating the existing 6-inch water line and another 6-inch pipe in the area. The two lines will come together to supply the lower portion of the loop.
- Install approximately 2300 feet of 8inch pipe from the existing water line near the flare to the unloading rack area. The source of this line will either be at the 8-inch portion of the line or the 6-inch portion and will be replaced with 8-inch line to provide the adequate flow rate.
- Provide 8-inch fire water loop around the unloading rack.
- Provide two FDC's with check valve between for boosting of pressure in fire water loop at unloading rack (if necessary).
- Two new lines will tie together for a short run to allow for repumping by refinery fire truck pump into looped system around rack.

Pipeline

Downstream of the meter assembly, a new 24-inch above ground pipeline would be routed along an existing internal dirt road on the Phillips 66 property between the unloading facility and the refinery to connect with the existing crude oil storage tanks. This dirt road accommodates periodic on-site traffic only associated with refinery personnel traveling at low-speeds. The line would be approximately 1100-yards (1005 m) in length.

Access Roads

Paved access roads would be constructed near the unloading rack and around the rail spur for access by operations, safety, and maintenance crews. The access road surrounding the rail spur would be 24 feet in width along the southern side of the spur and 12 feet in width along the northern side. Appropriately sized turn-around areas meeting County and CalFire standards and a mid-way track crossing are also included to maximize efficiency in the event of an emergency. Additionally, an eastern Emergency Vehicle Access route would be constructed from the eastern end of the rail spur to Highway 1 following existing agricultural roads. The secondary access road would be improved with decomposed granite or comparable surfacing to support emergency vehicles as prescribed by CalFire but would not be paved.

Security Fence

As required by the U.S. Department of Homeland Security, an extension of the existing chain link fencing topped with barbed wire would be required around the periphery of the new tracks. Additional lighting would also be required, though light would be shielded down to minimize glare in adjacent areas.

Spill Containment and Response Facilities

Drain boxes would feed below-grade 16-inch-diameter drain lines routed to two parallel rectangular storage tanks (approximately 40,000 gallons total volume) located in a vault for containment. Two pumps would transfer any contained oil/water through a new pipeline into the existing refinery's oily water system. The

system would be sized to contain the contents of one rail car as well as the foam and water that would be released from the fire suppression system.

Phillips 66 has a number of existing process safety policies and procedures that would apply to the rail project, including the equipment and operating procedures. These programs are designed to prevent releases of hazardous materials, minimize risk, and ensure the refinery's ability to process crude without increasing risk of releases. For example, the Mechanical Integrity Program covers equipment used to process, control, and store hazardous chemicals and assigns responsibility for equipment inspection and testing as well as maintenance. This program meets the requirements of CCR Title 8 Sec 5189, "Process Safety Management of Acutely Hazardous Materials" (f), (j) and 29 CFR 1910.119, "Process Safety Management of Highly Hazardous Chemicals" (j)

The refinery uses a Positive Material Identification (PMI) program to ensure the integrity of all mechanical and pressurized systems. This program is overseen by the refinery's Inspection Supervisor.

Any new feedstock coming to the refinery undergoes a complete Management of Change (MOC) analysis to ensure that all hazards, as well as the refinery's systems are safe and operable. The MOC program is part of the refinery's Process Safety Management program and tracks equipment modification, addition of new systems and process changes. MOC covers all changes that involve specific chemicals at or above threshold limits as defined in California Code of Regulation, Section 5189, Appendix A or flammable liquids or gasses as defined by California Code of Regulations, Section 5194(c) including new construction, modifications, changes in chemicals or materials, changes in feedstock, and changes in concentrations, temperatures, pressures, or flow rates outside of established Safe Process Limits.

The refinery is also covered by the California Accidental Release Prevention (CalARP) program, which is designed to prevent accidental releases potentially harming the public and the environment and to satisfy community right-to-know laws. Phillips 66 has prepared the required Risk Management Plan (RMP) to analyze the potential for accidents and development of operating procedures, training and maintenance requirements, compliance audits and incident investigation. The refinery additionally has an approved Spill Prevention, Control and Countermeasure Plan (SPCC).

Support Buildings

The unloading facility would include a small parking area and restroom facilities. Both men's and women's restroom facilities would be served by potable water and a septic system for wastewater disposal. All septic system components would be constructed in accordance with applicable State and County regulations and State Regional Water Quality Control Board standards.

Construction

Construction would require contractor mobilization, construction site preparation, establishment of a staging and equipment laydown area, clearing and grading, removal of the existing rail turnout, laying new track, and assembling the unloading facility and pipeline. The last stage of construction would include demobilization, soil stabilization, restoring vegetation, and removal and disposal of construction wastes (e.g., demolition materials, packaging, and other solid waste).

After contractor mobilization, the site would be prepared, the limits of disturbance would be clearly marked, and initial clearing and grubbing would occur within the construction area. The site would be graded and any remaining soil would be managed on-site. If specified by Union Pacific, the existing rail turnout would be modified to accommodate the planned unit trains, including demolition/removal of approximately 1,300 feet of existing track and placement of a new turnout track and signal, if needed. This work would occur within the existing track corridor and would not require impacts outside the existing disturbed area.

The primary facilities, including the rail extension, unloading station and pipeline, would be constructed by Phillips 66 construction contractors. The number of construction workers would peak at approximately 200. Trucks would import construction materials and components (e.g., track segments, pipe), which would be stored on site in a laydown area. Track construction would include grading, soil compaction and stabilization, placement of sub-ballast and installation of rail, ties and ballast. Track ballast is used to form the rail track bed to allow drainage and to bear the weight of the rail cars. Delivery of construction materials would avoid peak traffic hours.

The unloading facility and system would be assembled adjacent to the completed tracks with connections to the refinery pipeline, stormwater collection system, and oily water treatment system.

Construction Schedule

The overall construction is anticipated to occur over a period of 9 – 10 months. In some cases, portions of the individual tasks below would occur concurrently.

- Turnout track replacement (if needed) – 2 months
- Grading/Soil Transport – 4 months
- Construction of Pipeline – 1 month
- Construction of Tracks – 4 months
- Construction of Unloading System – 2 months

Project Operations

Project operations would include unloading of up to five trains per week. Trains would arrive from different oilfields and/or crude oil loading points depending on market availability. In a unit train configuration, each train would consist of two locomotives, two buffer cars, and eighty railcars carrying 23,500 gallons each or seventy-three railcars carrying 30,000 gallons each depending on the car size, for a total of approximately 2,190,000 gallons (52,142 bbls) or 2,400,000 (57,143 bbls) of crude oil. In a manifest train configuration, varying number of railcars would be dropped off at SMR by a passing train. A dedicated locomotive would remain on-site to move cars.

Because trains would arrive at different times throughout the week, the number of workers would vary depending on the number of trains and worker arrival and departure time would vary throughout the day and night.

Unloading Sequence

The tracks and unloading rack would be designed to allow for the safe and efficient movement of multiple trains and cars in and out of the facility while minimizing the required space. Union Pacific locomotives

would arrive on Union Pacific's mainline track heading south to the SMR. Locomotives would move tank cars into the unloading facility with 10 cars positioned at the unloading rack. Phillips 66 crews would manage movement of the rail cars on-site, unloading 10 cars at a time. Emptied cars would be moved to a storage track. After unloading all cars, train crews would attach locomotives to the empty cars and depart to the west and then to the north and off the Phillips 66 property. Sufficient track would be available to store a second train should one arrive.

Workers would unload incoming unit trains and then disconnect the unloading pumps and prepare the railcars for departure. Phillips 66 would also refuel locomotives when the locomotives were used as switch engines to move the tank cars on and off the track. Locomotive refueling would be completed using a tank truck or a permanent refueling station with a fixed tank and fuel metering system. This process includes repressurizing the brakes using an air compressor system and replenishing the sand used by the locomotives for traction.

Coastal Access Route

As part of a separate Development Plan/Coastal Development Permit initiated in 2008 ("Throughput Project"; Permit DRC2008-00146) and approved by the San Luis Obispo County Board of Supervisors on February 26, 2013, Phillips may be required to construct vertical public access from Highway 1 to their western property line consistent with the County requirement in Section 23.04.420 – Coastal Access Required, as part of the Rail Spur Project. The access would lead into the Oceano Dunes State Vehicular Recreation Area. The size and alignment of such access, as well as the appropriateness of the access, considering the existing environmental setting, public safety concerns, and the current land uses in the area is currently under consideration by the California Coastal Commission and the County.

The County has requested that a feasibility study be prepared to consider coastal access across the SMR. That document is currently in preparation. For purposes of the current project description for the rail spur project, a representative coastal access route has been developed in accordance with the alignment proposed in the County Conditions of Approval for the Throughput Project generally following existing roads on the SMR property. One alternative route has also been proposed to avoid areas previously mapped to support the endangered Nipomo Mesa lupine (Figure 8).

The conceptual routes considered are approximately 1.5 miles in length and 30-feet in width. The routes would require users to cross the active main railroad lines. It is assumed that the route would include a paved pedestrian and bicycle path. The access would not be intended to provide a new vehicle access route to the Oceano Dunes State Recreational Vehicles Area.